

CLAIMS:

1. A method comprising:
emitting energy at a first wavelength toward an analyte detector implanted in a body of a patient, the analyte detector including a binding site for an analyte, and the analyte detector including at least two fluorescent dyes;
detecting energy emitted by a first one of the dyes at a second wavelength based on fluorescent resonant energy transfer from a second one of the dyes in response to the emitted energy at the first wavelength; and
detecting a change in a concentration of the analyte as a function of the detected energy.
2. The method of claim 1, further comprising comparing the detected change to a threshold.
3. The method of claim 1, further comprising taking action when the detected change surpasses a threshold, wherein taking action comprises at least one of generating an alert and generating a communication to a therapy device.
4. The method of claim 1, further comprising detecting energy at a third wavelength emitted by the second one of the dyes in response to the emitted energy at the first wavelength.
5. The method of claim 4, further comprising determining a ratio between a detected intensity of the energy at the second wavelength and a detected intensity of energy at the third wavelength.
6. The method of claim 4, wherein detecting the change in concentration of the analyte comprises detecting a change in an intensity of the energy at the second wavelength relative to a detected intensity of energy at the third wavelength.

7. The method of claim 4, wherein the first one of the dyes absorbs energy received from the second one of the dyes at the third wavelength via fluorescent resonant energy transfer and emits energy at the second wavelength in response to receiving the energy at the third wavelength.
8. The method of claim 1, wherein the energy is visible light.
9. The method of claim 1, wherein the analyte comprises cardiac troponin-T antigen.
10. The method of claim 1, wherein the analyte comprises at least one of a D-dimer that accompanies an ischemic stroke, a virus, insulin, an administered medication, an illegal drug, a food pathogen, a biological toxin, and a biological warfare agent.
11. A system comprising:
 - a light emitter to emit energy at a first wavelength;
 - an analyte detector implanted in a body of a patient, the analyte detector including a binding site for an analyte and at least two fluorescent dyes;
 - a light detector to detect energy at a second wavelength emitted by a first one of the dyes based on fluorescent resonant energy transfer from a second one of the dyes in response to the emitted energy at the first wavelength; and
 - a processor to detect a change in a concentration of the analyte as a function of the energy detected by the light detector.
12. The system of claim 11, wherein at least one of the fluorescent dyes comprises fluorescein 5-isothiocyanate, tetramethylrhodamine 5-isothiocyanate, tetramethylrhodamine 6-isothiocyanate and aminomethylcoumarin acetate.
13. The system of claim 11, further comprising a therapy device to deliver therapy to the patient based on the detection of the change in a concentration.

14. The system of claim 13, wherein the therapy device comprises at least one of an implanted drug delivery device, a pacemaker and an electrical stimulator that stimulates at least one of an organ, a muscle and a nerve.
15. The system of claim 13, further comprising a communication module to generate a wireless communication from the processor to the therapy device.
16. The system of claim 13, wherein the processor is configured to compare the detected change to a threshold.
17. The system of claim 11, further comprising an alert module to notify the patient based on the detection of the change in a concentration.
18. The system of claim 11, wherein the a light emitter and the light detector are implanted in the body of the patient.
19. The system of claim 11, wherein the light detector is configured to detect energy at a third wavelength emitted by the second one of the dyes in response to the emitted energy at the first wavelength.
20. The system of claim 19, wherein the processor is configured to determine a ratio between a detected intensity of the energy at the second wavelength and a detected intensity of energy at the third wavelength.
21. The system of claim 19, wherein the processor is configured to detect the change in concentration of the analyte by detecting a change in an intensity of the energy at the second wavelength relative to a detected intensity of energy at the third wavelength.
22. A device comprising:
 - a substrate;
 - two fluorescent dyes; and

a plurality of sensing elements anchored to the substrate, each sensing element including a binding site for an analyte, and each sensing element configured to bring the dyes into proximity to allow fluorescent resonant energy transfer when the analyte binds to the binding site.

23. The device of claim 22, wherein at least one of the fluorescent dyes comprises fluorescein 5-isothiocyanate, tetramethylrhodamine 5-isothiocyanate, tetramethylrhodamine 6-isothiocyanate and aminomethylcoumarin acetate.

24. The device of claim 22, further comprising an anchoring agent to anchor at least one sensing element to the substrate.

25. The device of claim 24, wherein the anchoring agent comprises Protein A.

26. The device of claim 24, wherein the substrate comprises at least one of silicone and glass.

27. The device of claim 22, wherein at least one sensing element comprises an antibody molecule.

28. The device of claim 27, wherein the antibody molecule comprises a Troponin-T antibody molecule.

29. The device of claim 22, wherein the substrate comprises a permeable material to anchor the sensing element to the substrate.

30. The device of claim 29, wherein the permeable material comprises at least one of a hydrogel and a matrix of polytetrafluoroethylene.

31. The device of claim 22, wherein the substrate includes a surface having ridges and grooves.

32. The device of claim 22, wherein the device is implantable in a patient.
33. A computer-readable medium comprising instructions for causing a programmable processor to:
- control a light emitter to emit energy at a first wavelength toward an analyte detector implanted in a body of a patient, the analyte detector including a binding site for an analyte, and the analyte detector including at least two fluorescent dyes;
 - receive a signal from a detector as a function of energy emitted by a first one of the dyes at a second wavelength based on fluorescent resonant energy transfer from a second one of the dyes in response to the emitted energy at the first wavelength; and
 - detecting a change in a concentration of the analyte as a function of the received signal.
34. The medium of claim 33, the instructions further causing the processor to compare the detected change to a threshold.
35. The medium of claim 33, the instructions further causing the processor to take action when the detected change surpasses a threshold, wherein taking action comprises at least one of notifying a patient and generating a communication to a therapy device.
36. The medium of claim 33, the instructions further causing the processor to receive a signal from the detector as a function of energy at a third wavelength emitted by the second one of the dyes in response to the emitted energy at the first wavelength.
37. The medium of claim 36, the instructions further causing the processor to determine a ratio between a detected intensity of the energy at the second wavelength and a detected intensity of energy at the third wavelength.